

Air Force

SBIR

Impact



SBIR Technology Improves Testing of GPS Receiver Equipment

Company:
Control Systems
Research, Inc.

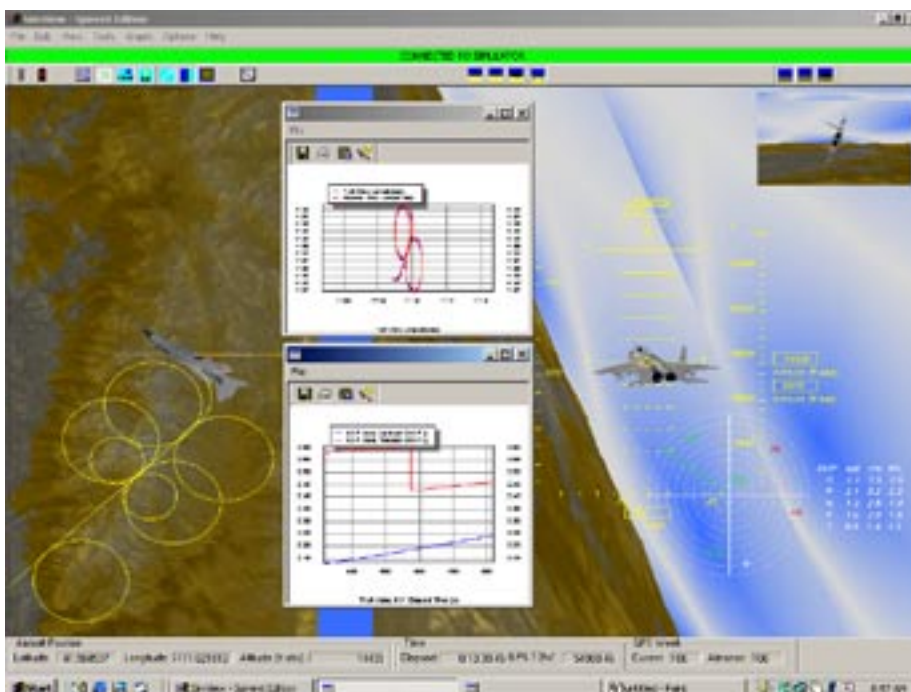
Location:
Crestview, FL

Employees:
14

President:
Jesse Fowler

Project Officers:
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GPS JSSMO

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WRALC/LYSBG
Robins AFB, GA



**Real Time
Motion,
Waypoints,
Blanking
Analysis.**

Air Force Requirements:

The Air Force relies heavily on Global Positioning Systems (GPS) for meeting Air Force mission objectives. The proper maintenance and testing of airborne GPS receiver equipment is crucial. Stimulation and analysis testing of GPS receivers in laboratory conditions, with flexible GPS Radio Frequency (RF) simulators and Commercial Off-the Shelf (COTS) personal computer (PC) based hardware, is viewed as vital to the continued support of fielded GPS equipment.

SBIR Technology:

Control Systems Research, Inc. (CSR) was awarded a Small Business Innovation Research (SBIR) contract to apply PC-based instrumentation and 3-dimensional technologies to the process of GPS receiver testing. CSR's real-time Windows 2000™ Visualization and Blanking Tool (VBT) system combines Digital Elevation Terrain Data (DTED) with aircraft solid object models. This combination of systems provides scientists and engineers the ability to investigate the effects of signal masking or blanking on GPS receiver performance. Coupled with the

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visualization system is the PC-based Simulation Communications Translator (SCT) real-time instrumentation system also hosted on the Windows 2000™ operating system. The SCT system provides a central control for all hardware-in-loop control and data capture functions to a satellite constellation simulator and GPS receivers. Included is the ability to create motion trajectories from waypoint, joystick or external files. Combined, the VBT and SCT systems allow GPS Environmental Simulators the capability to stimulate, record and analyze GPS receiver performance to a greater fidelity than ever before while using standard COTS hardware and custom application software in a cost effective package.

Company Impact:

The VBT and SCT technology is being evaluated at Robins AFB. CSR has recently adapted and licensed these products to support a commercial manufacturer of RF signal generators. Using the experience gained in earlier SBIR efforts, CSR is beginning a new Phase I SBIR effort sponsored by Air Force Research Laboratory to integrate Distributive Interactive Simulation capabilities. There are numerous applications for this technology including aircraft, space, land, weapons and RF propagation requirements.

Company Quotes:

"The SBIR program has allowed us to investigate aspects of GPS testing that have always been of concern, but difficult to achieve as a small business. The integration of our products to the high performance L3-IEC and Spirent Federal GPS RF simulators adds COTS benefits to military and commercial users."

Jesse Fowler
President
Control Systems Research, Inc.

"The technology developed in this SBIR is important to the Air Force because as GPS has become an increasingly important tool for the war fighter, so has the reliance on this technology. The Air Force has established the Integrated Support Facility (ISF) for testing GPS receivers in a simulated environment. The systems CSR developed helps the ISF extend its capabilities to control, log, and reduce the message traffic between GPS satellite simulators and GPS User Equipment (UE) as well as provide 3-D GPS coverage visualization. The 3-D VBT allows the ISF analyst to create virtual test environments (i.e. real-world terrain, fuselage, and inertial effects) to investigate masking of RF signal sources (satellites, pseudolites, and jammers) on GPS UE performance. This technology will enhance GPS UE problem duplication/analysis and GPS Mission Planning and Search and Rescue capabilities that support the war fighter."

Paula O. Brandon, WRALC/LYSBG
SBIR Project Officer

SBIR

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AF Topic# 98-267
Sec. Rev.# WRALC/PA #02-06-31
Impact Story IS#34.0 - 08/02